

## Infant Mortality and Stillbirths in North Lincolnshire 2015

### Headlines

- Infant death rates have fallen significantly in the last two decades, both locally and nationally
- Stillbirth rates, on the other hand, have not fallen as fast
- There are on average 5 still births each year in North Lincolnshire, and between 5-10 infant deaths, although numbers can, and do, fluctuate from one year to the next
- Whilst still birth and infant mortality rates are no higher in North Lincolnshire than they are nationally, there are many things that local agencies can do to reduce the risk of stillbirth and infant deaths
- Key modifiable risk factors include maternal mental health, smoking, excess weight and diabetes in pregnancy.
- Effective targeted interventions include:
  - Improvements in maternal health
  - Effective management of diabetes pre conception and throughout pregnancy
  - Reduction in smoking pre conception and during pregnancy
  - Reducing exposure to passive smoking
  - Healthy weight management pre conception and during pregnancy
  - Increasing income levels amongst the poorest women
  - Promotion of safe sleeping practices
  - Early take up of antenatal care amongst pregnant women
  - Reduction in alcohol and other substance misuse pre conception and throughout pregnancy
  - Access to safe and high quality maternity services for those at greatest risk of late attendance
  - Raising breastfeeding rates amongst women, targeting low income women who are least likely to initiate
- Some of these potentially modifiable risk factors are worse than national rates in North Lincolnshire, including
  - higher than average rates of smoking amongst teenage girls, younger pregnant women, and amongst low income adults,
  - higher than average rates of adult obesity, including amongst women of child bearing age, and pregnant women.

## Key issues for the future

- Changing demographic profile, and increasing diversity of population of women of childbearing age
- Rising levels of obesity in the population of women of childbearing age
- Increasing risk of type 2 diabetes in the childbearing population
- Higher than average rates of smoking amongst teenage girls in North Lincolnshire, which although falling, have not declined as fast they have for boys. 15% 15 year old girls in North Lincolnshire reported being regular smokers in the 2013 adolescent lifestyle survey, compared with 8% nationally.
- Reconfiguration of specialist services, between Public Health England, NHS England, NHS North Lincolnshire CCG, and local authority Public Health.
- Maintaining priority focus on maternal and infant health in the Joint Health and Wellbeing Strategy
- Raising awareness of the risks of smoking and excess weight to young women prior to conception
- National review of maternity services as outlined in the NHS Five Year Forward View – which is planned to conclude by end of 2015.
- Implementation of the recommendations of the national confidential enquiry into maternal deaths and morbidity, 2011-13, 'Saving Lives, Improving Mothers Care' and of the National Diabetes in Pregnancy Audit, 2014
- Healthy Lives Healthy Futures review of acute provision in Northern Lincolnshire and Goole.

## Recommendations

- Develop a strategic focus on improving preparation for pregnancy for women with key risk factors, including women of child bearing age with, or who are at risk of developing diabetes, women who smoke, women with significant mental health problems.
- Raise awareness amongst staff and the public about the importance of healthy weight and diabetes management prior to conception, and the need to seek specialist medical advice at the earliest opportunity in pregnancy
- Incorporate this into patient education for women with Type 2 diabetes
- Focus on improving blood sugar control for women with diabetes during pregnancy
- Routine data monitoring of the number of women of child bearing age with Type 1 and Type 2 diabetes by GP practice in order to target women appropriately for pre conception information.
- Review pathways into maternity services to ensure that women, especially those at high risk are accessing antenatal care early in pregnancy.
- There are a number of organisations providing social welfare support in disadvantaged neighbourhoods in North Lincolnshire, with a proven track record of effective engagement with 'hard to reach' communities. There may be scope to develop the links with these community assets to overcome barriers to access for disadvantaged women in the early stages of pregnancy and beyond.

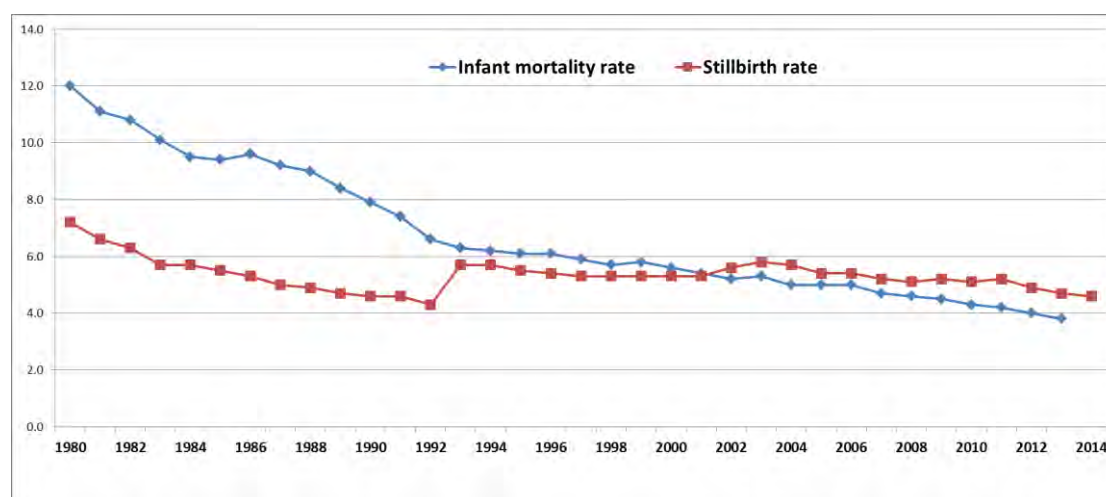
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## Introduction

- Stillbirths and deaths of babies in the first weeks and months of life are a devastating outcome for the families involved.
- While infant mortality rates (deaths in the first year of life) and neonatal mortality rates (deaths in the first 4 weeks of life) in England have reduced substantially since the 1980s, (by 67% and 60% respectively), rates for stillbirths (>24 weeks after conception) have remained largely static, especially since the early 1990s. As a result, stillbirths have become the largest contributor to perinatal mortality, (stillbirths and early neonatal deaths ie within 7 days ) and are a major public health burden.
- Recent international studies identified that stillbirth rates in the UK ranked 33<sup>rd</sup> out of 35 similar high income countries, ( where 1 = the best and 35 = the worst rate).

**Figure 1: Trends in annual stillbirth and infant mortality rates in England and Wales, 1980-2014**



Source: Child Mortality Statistics, 2014, ONS Births Statistics 2014

Although the reasons for stillbirths and neonatal deaths are varied and complex, there is a clear consensus that many of these cases are preventable and that there are a range of measures that can be taken to improve stillbirth and neonatal mortality rates. Hence the inclusion of these indicators in the national Public Health Outcomes Framework and the NHS Outcomes Framework.

## Definitions

### Still births

Still births occur when a baby is born dead at 24 weeks or more of pregnancy. If a baby dies before 24 weeks it is known as a miscarriage. Nationally 1 in 200 births result in a stillbirth. In North Lincolnshire the number of stillbirths averages at about one a month. However, this number can vary annually from as many as 20 to as few as 4 a year. Stillbirths are most commonly associated with placental complications, with a smaller proportion linked to congenital malformations, and poor maternal health, including pre eclampsia and infections. In 2014, there were 5 stillbirths in North Lincolnshire, and 12 in 2015.

## Infant deaths

Infant deaths are defined as deaths in the first year of life. Infant deaths tend to occur in the first few weeks of life, commonly as a result of extreme immaturity, and/or complex congenital malformation. When they occur in the first 4 weeks after birth they are referred to as neonatal deaths. In 2014 there were 5 infant deaths and 6 in 2015. (See paragraph below).

## Perinatal deaths

Perinatal deaths encompass both stillbirths and early neonatal deaths ie deaths within 0-6 days of life. In 2014 there were 8 perinatal deaths in North Lincolnshire and 8 in 2015.

## Neonatal deaths

Neonatal deaths are defined as deaths within the first 4 weeks of life. In North Lincolnshire there were 4 neonatal deaths in 2014 and 3 in 2015.

## What's the local picture?

The number and rate of infant deaths and stillbirths has fallen during the last two decades in line with the national average (see Table 1 overleaf). The latest available data suggests that local rates are currently in line with or below the national average, although local numbers are small and such fluctuations in rates may not be statistically significant.

Each year there are between 5-10 infant deaths a year in North Lincolnshire, although numbers can and do fluctuate each year, especially in an area as small as North Lincolnshire. In 2014, there were 5 infant deaths in North Lincolnshire, of which 4 occurred in the first 4 weeks of life.

There are an average of between 10-15 perinatal deaths a year in North Lincolnshire. In 2014, there were 8 perinatal deaths in North Lincolnshire.

There are on average, 5 neonatal deaths a year in North Lincolnshire. In 2014 there were 4 neonatal deaths. In other words, all but one of the infant deaths that occurred in that year were within the first four weeks of life.

**Figure 2: North Lincolnshire trends 2000-2014**



**Table 1: Infant, perinatal, neonatal mortality and stillbirth numbers and rates by year 1999-2014 North Lincolnshire**

(\*The figures for 2015 are local and provisional and may be subject to change)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*
Live births	1629	1563	1570	1606	1680	1758	1819	1848	1861	1940	1888	1872	1957	1840	1738	1853
Infant deaths	17	10	8	7	11	13	10	5	7	5	12	7	8	8	5	6
Infant mortality Rate per 1,000	10.2	6.3	5	4.3	6.5	7.2	5.4	2.7	3.7	2.6	6.4	3.7	4.1	4.3	2.9	3.2
Perinatal deaths	24	12	16	19	17	14	9	10	15	11	26	19	10	17	8	8
Perinatal mortality rate per 1000	14.3	7.5	9.9	11.6	9.9	7.8	4.9	5.3	7.9	5.6	13.9	10.1	4.6	9.1	4.6	4.3
Stillbirths	15	8	11	16	13	9	7	9	12	8	20	16	7	12	5	12
Stillbirth rate per 1,000	8.9	5.1	7	10	7.7	5	3.8	4.9	6.3	4.2	10.6	8.6	3.6	6.5	2.3	6.5
Neonatal deaths	13	5	6	5	6	6	5	3	6	3	6	7	4	8	4	3
Still birth and neonatal death rate	16.6	8.1	10.5	12.8	12.3	8.3	6.5	6.4	9.5	5.6	14.7	11.1	5.6	10.8	5.2	4.8

Source: ADDE and ADBE, PHMF and PCMD 2003-2014

## How do we compare?

### Infant mortality (PHOF 4.01)

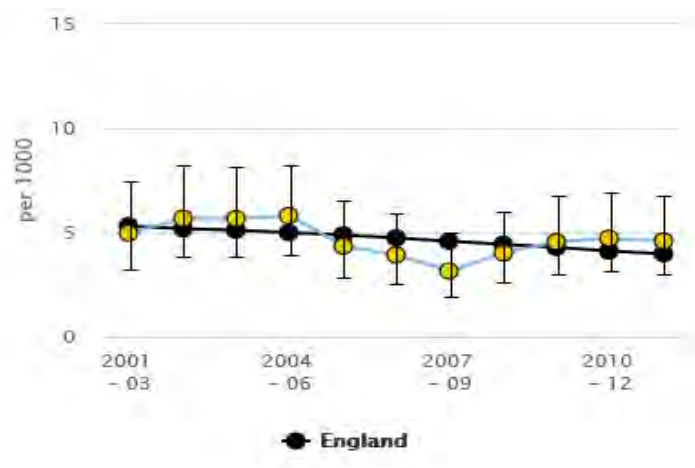
Throughout the last decade, infant death rates in North Lincolnshire have fluctuated although the changes have not been statistically significant, and local rates remain either below or in line with the national average.

As the number of infant deaths each year is relatively small, quite large annual fluctuations in rates are not uncommon. For example in both 2012 and 2013 there were 8 infant deaths in North Lincolnshire, representing an infant mortality rate of 4.1 and 4.3 per 1000 live births, respectively. This compares with 2010, when there were 12 infant deaths, representing a rate of 6.4 per 1000. In 2014, the number fell to 5 infant deaths, giving a rate of 2.9 per 1,000.

Because these are relatively rare occurrences, *rates are pooled over 3 years* with confidence intervals, to monitor trends over time and to compare infant deaths across local authority areas and at national and regional level. The figure below compares trends in North Lincolnshire with the regional and national average and shows that local rates are in line with the national average.

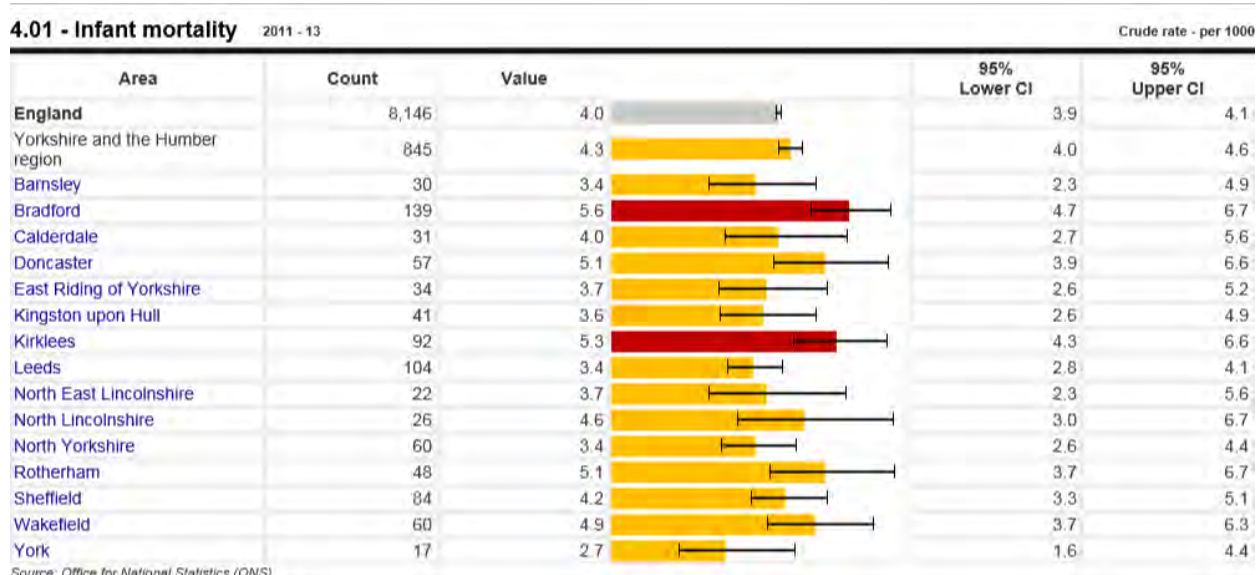
In 2011-13, (the latest available published data at time of writing), the local 3 year pooled rate was 4.6 per 1000, compared with a national and regional average of 4.3 and 6.7 respectively.

**Figure 3: 3 year pooled infant mortality rates in North Lincolnshire, and England 2001-13**



Source: Public Health England, 2015

**Figure 4: Comparison of 3 year pooled infant mortality rates in North Lincolnshire and Yorkshire and the Humber 2011-13**

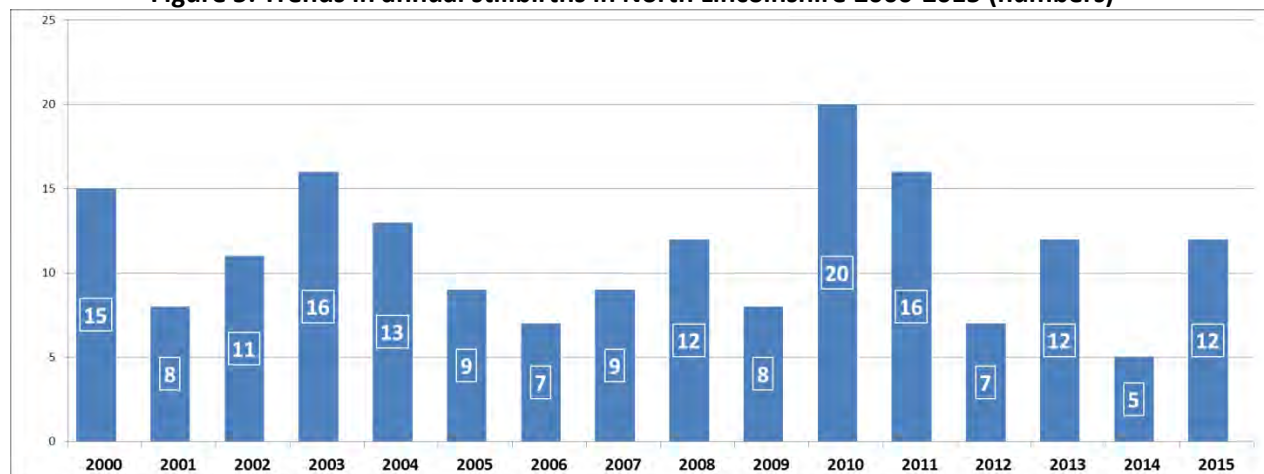


Source: Public Health England, 2015

### Stillbirths

The stillbirth rate in North Lincolnshire for the three year period 2011-13 was above national rates, but not significantly so, at 4.4 per 1,000, and there are currently no on-going issues with local stillbirth rates. This decline has been sustained, with a provisional annual local stillbirth rate of 2.3 per 1000 live and stillbirths in 2014, and a 3 year rate for 2012-14 of 4.6 per 1000.

**Figure 5: Trends in annual stillbirths in North Lincolnshire 2000-2015 (numbers)**



Source: ADDE, 2015

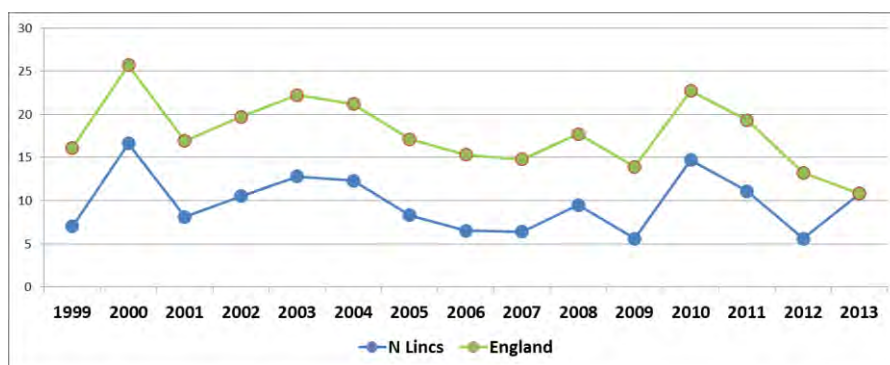


### Stillbirths and neonatal mortality NHS OF 1.6ii

The NHS Outcomes Framework includes an indicator on stillbirths and neonatal mortality rates, (NHS OF Indicator 1.6 ii) (ie deaths at 24+ weeks gestation or in first 4 weeks of life) as a way of monitoring the outcomes of NHS care during pregnancy, birth and immediately after birth.

The latest published rate for stillbirth and neonatal mortality in North Lincolnshire (2013) is 10.8 per 1000, compared with 5.6 per 1,000 in the previous year. However this difference is not statistically significant.

Figure 6: Trends in stillbirth and neonatal mortality rates in North Lincolnshire, 1999-2013

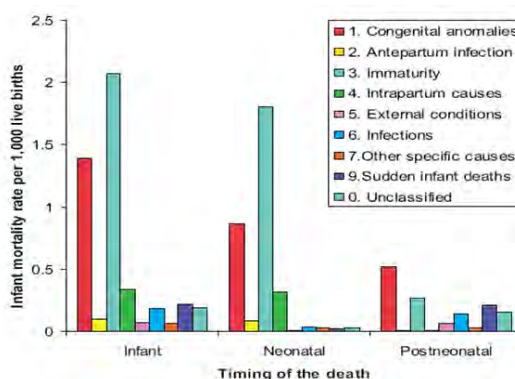


Source: HSCIC, 2014

### Risk factors for infant mortality (deaths within first year of life)

The main causes of infant mortality nationally, and in North Lincolnshire are conditions originating in the perinatal period, (ie 24+ weeks gestation and first 7 days of life), (28%), extreme immaturity, (44%) (and associated respiratory and cardiovascular conditions) and congenital anomalies (28%).

Figure 7: Main causes of infant deaths by timing, England, 2009



Source: Infant Mortality Briefing paper, (1) Oxford Perinatal Epidemiology Unit, 2009

In the 11 year period, 2003-14, sudden unexplained infant death syndrome (SIDS) accounted for less than 3% of all infant deaths in North Lincolnshire.

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Key risk factors for infant mortality include:

- Extreme prematurity at birth
- Mothers' age (particularly those aged under 20, or 40 plus)
- Very low birthweight

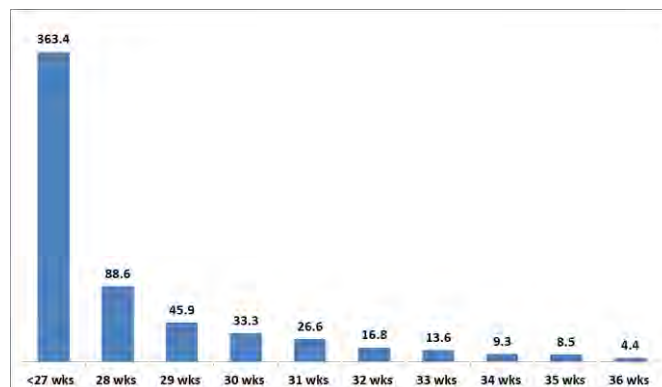
Additional risk factors for both infant mortality and stillbirth include:

- having twins or a multiple pregnancy
- having diabetes, high blood pressure or a blood-clotting disorder
- being a smoker
- being obese

### Extreme prematurity

Preterm births are defined as any live birth below 37 weeks gestation. The more premature the birth, the higher the mortality rate, especially in the first few days and weeks of life. The highest mortality rates are associated with very preterm births (<28 weeks), which nationally have an average infant mortality rate of 363.4 per 1,000, compared with a rate of 1.4 per 1,000 of full term births. Almost all of these very pre term babies will be very low weight (ie <1,000g).

**Figure 8: Infant mortality rate by gestational age, England 2013**



In 2013, 7.4% of live births across England were preterm, and 0.4% very preterm, compared with 8% and 0.2% respectively in North Lincolnshire.

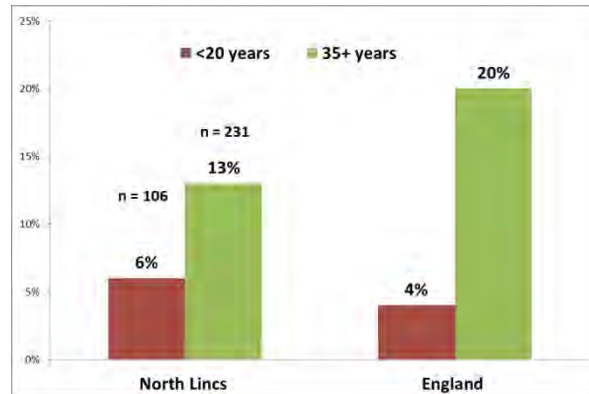
### Age

The highest rates of infant mortality across the country as a whole are amongst women aged under 20 years, (5.5 deaths per 1,000 live births, compared with 4.0 per 1,000 overall), (ONS, 2013). North Lincolnshire has historically had a lower than average proportion of births amongst women over 40 and a higher than average proportion of births to younger women. However, this trend has changed in recent years, as the number of teen births has declined, and the number of women delaying pregnancy

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and childbirth has risen. In 2014, there were 106 births to women under 20 years of age in North Lincolnshire, representing 6% of all births compared with 4% nationally. In the same year 13% of births were to women aged 35+ compared with 20% nationally.

**Figure 9: Age of mother at birth (2014)**



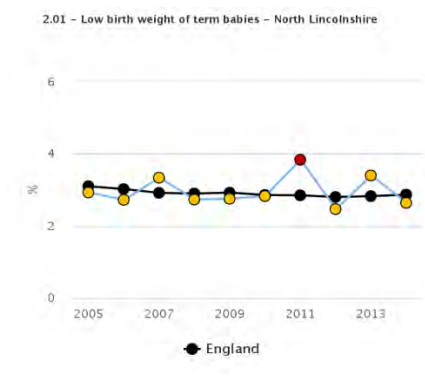
Source: ONS, 2015

## Very Low birthweight

Low birth weight is associated with both multiple births (see below) and age of mother, with older women being more likely to have multiple births and babies with congenital anomalies, both of which increase the likelihood of babies being of low, or very low birthweight, and increase the risk of stillbirth and neonatal death. In 2011, across the country as a whole, there were 172.6 deaths per 1,000 live births for very low birthweight babies (under 1,500 grams) and 36.5 deaths per 1,000 for low birthweight babies (ie. under 2,500 grams). This compares with a rate of 1.4 deaths per 1,000 among babies of healthy birthweight (ie of 2,500 grams or more).

The national Public Health Outcomes Framework, (PHOF), indicator associated with low birth weight is 'PHOF 2.01 low birth weight of full term babies'. In 2014, 41 full term babies, (less than 3% of all full term births) were of low birth weight in North Lincolnshire, a small (but statistically insignificant) decline on 2013, when the rate was 3.4 %. National and regional data for 2014 suggest we are in line with the average.

**Figure 10: % low birth weight (<2500 g) amongst full term babies (PHOH 2.01)**



Source: Public Health Outcomes Framework, 2015

## Multiple births

The infant mortality rate for multiple births is five times higher than for singleton births. On average, multiple birth babies tend to have a lower birth weight than singleton births, which is one reason why the infant mortality rate is higher for this group. Just over half of multiple birth babies (55%) are of low birthweight, compared to 5.5% of singleton babies. Although multiple births may occur naturally, many occur as a result of fertility treatment. Approximately 25% of in vitro fertilisation (IVF) pregnancies result in either twins or triplets compared with 1% of pregnancies conceived naturally. Nearly two-thirds of all multiple births in 2012 across England and Wales were born to women aged 30 years or over.

In England and Wales, the incidence of twins and other multiple births is 1 in 32 births, or just over 3%. For women aged under 25 years the prevalence is less than 1% rising to 12.9% for women aged 45+.

In North Lincolnshire, the overall prevalence of multiple births in 2014 was 2%, of which half were to women aged 30+.

## Diabetes

A Public Health England survey of pregnant women with diabetes in the North East of England (2013) suggests that pregnant women with diabetes have a much higher rate of stillbirth (4.6 times higher) and infant death (1.9 times higher) than mothers without diabetes. They are also more likely than other women to have larger babies and to have babies affected by neural tube defects. The highest risks were observed in women with a HbA1c value of over 48 mmol/mol (6.6% or above), and those who had developed diabetic retinopathy before their pregnancy and those with a low folic acid intake. The risks were similar whether women had Type 1 or Type 2 diabetes.

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- This research highlights the need to get blood glucose levels under good control and taking folic acid at least 3 months before pregnancy, as recommended by NICE, and specifically to ensure that women are adequately prepared for pregnancy, in order to minimise risk.

The second annual national audit of compliance with quality standards for clinical care of pregnant women with diabetes was published in November 2015 and whilst compliance had improved compared with the previous year's results, the study found that across Yorkshire and the Humber only

- 9% pregnant women with Type 1 diabetes and 24% women with Type 2 achieved the target readings for blood glucose in early pregnancy as set out in national guidelines.
- 34% women with Type 2 diabetes were taking folic acid and 6% were taking potentially harmful medications (such as statins, ACE inhibitors, and ARBs) at the time of conception
- More than 10% women with diabetes were not seen by a specialist antenatal team until at least their 12<sup>th</sup> week of pregnancy.

(National Pregnancy in Diabetes Audit, 2014)

Currently, there are no routine local data available on the number of women of child bearing age with Type 1 or Type 2 diabetes in North Lincolnshire. However, it is a relatively common condition, affecting roughly 1 in 250 women nationally. Assuming prevalence amongst childbearing age women is at least as high as that reported nationally, we would expect at least 0.4% women giving birth to have pre-existing diabetes, with a further 4% developing gestational diabetes, ( which may or may not resolve in pregnancy).

Based on current population estimates, this suggests between 8-10 pregnancies a year in North Lincolnshire in women with pre existing diabetes, and 80-100 with gestational diabetes.

National audit data suggest that women with Type 2 diabetes make up an increasing proportion of this group, (45% in 2013, compared with 10% in 2003), and tend to have a higher BMI, and be older at the time of pregnancy than women with Type 1 diabetes. They are also more likely than women with Type 1 diabetes, to live in areas of deprivation. The prevalence of adult obesity is significantly higher in North Lincolnshire than nationally, so it is likely that the number of child bearing age women with gestational or pre existing type 2 diabetes in North Lincolnshire is above the national average.

Nationally, we know that the prevalence of Type 2 diabetes is increasing rapidly in the population, due to rising obesity, with diabetes being increasingly diagnosed in younger, child bearing age women. This is likely to result in further increases in the number of pregnant women presenting to midwifery services with diabetes, both locally and nationally. Rising levels of excess weight in childbearing age women, and rising maternal age is also leading to rising prevalence of gestational diabetes.

In view of the high risk nature of pregnancies in women with diabetes, the national audit recommended a renewed commitment by local services to:

- Urgently develop a strategic focus on improving preparation for pregnancy
- Raise awareness amongst staff and the public about the importance of healthy weight and diabetes management prior to conception, and the need to seek specialist medical advice at the earliest opportunity in pregnancy
- Incorporate this into patient education for women with Type 2 diabetes
- Focus on improving blood sugar control for women with diabetes during pregnancy

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- Locally, this might also include the provision of routine data monitoring of the number of women of child bearing age with Type 1 and Type 2 diabetes by GP practice in order to target women appropriately for pre conception information.

These recommendations were reinforced recently in the Chief Medical Officer's report (2015) which focussed on Women's Health.

In January 2016 NICE published Quality Standards for managing diabetes and its complications in women, including those of childbearing potential, those who are planning to become pregnant or are already pregnant. See <https://www.nice.org.uk/guidance/qs109/chapter/introduction>

This quality standard specifies that services should be commissioned from and coordinated across all relevant agencies encompassing the whole diabetes in pregnancy care pathway. Specifically the standard recommends that: :

### List of quality statements

Statement 1. Women with diabetes planning a pregnancy are prescribed 5 mg/day folic acid from at least 3 months before conception.

Statement 2. Women with pre-existing diabetes are seen by members of the joint diabetes and antenatal care team within 1 week of their pregnancy being confirmed.

Statement 3. Pregnant women with pre-existing diabetes have their HbA1c levels measured at their booking appointment.

Statement 4. Pregnant women with pre-existing diabetes are referred at their booking appointment for retinal assessment.

Statement 5. Women diagnosed with gestational diabetes are seen by members of the joint diabetes and antenatal care team within 1 week of diagnosis.

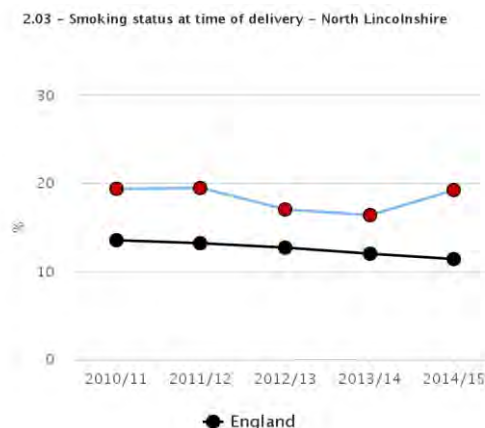
Statement 6. Pregnant women with diabetes are supported to self-monitor their blood glucose levels.

Statement 7. Women who have had gestational diabetes have an annual HbA1c test.

## Smoking

Smoking is a major risk factor for both infant mortality and stillbirth, contributing to low birthweight. Babies born to women who smoke weigh, on average, 200g less than babies born to non smokers.

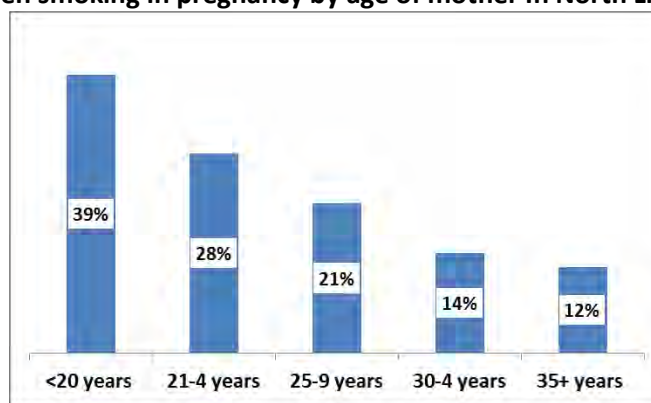
**Figure 11: % women smoking in pregnancy**



Source: HSCIC, 2015, PHOF, 2015

Although rates of smoking in pregnancy have fallen in the last decade and a half, they have changed little in the last 5 years locally, and rates remain above the national average, at 19.2% in North Lincolnshire compared with 11.4% nationally, (2014/15), with rates as high as 39% for younger pregnant women. The overall number of women smoking in pregnancy in 2014/15 was more than 300 in North Lincolnshire. In order to meet national rates the number would need to reduce by more than 130.

**Figure 12: % women smoking in pregnancy by age of mother In North Lincolnshire 2014/15**



Source: NLaG, 2015

Historically, take up of the stop smoking services by pregnant women has been relatively poor in North Lincolnshire, although this is improving year on year. In 2014/15, 115 pregnant women took up the service in North Lincolnshire, compared with 89 in the previous 12 months, of which 49 quit within 4

weeks. Women under 20 had the lowest uptake of the service of any pregnant smokers referred to the service, and the lowest quit rates, suggesting a need for a more targeted approach to this age group.

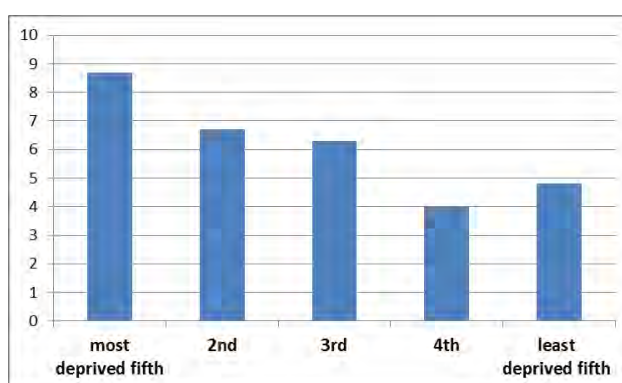
### Deprivation and low income

Despite a continuing fall in infant mortality rates in England during the last 30 years, rates remain higher in younger women and women in low income groups. National data show that infant mortality rates are highest in areas of deprivation and specifically for babies with fathers employed in low paid, low skilled jobs. In 2011, in England and Wales, infant mortality rates were twice as high for babies born to fathers employed in routine and semi routine occupations, than to fathers employed in senior managerial and professional jobs.

Low birth weight and prematurity, two key risk factors for infant mortality, are both consistently and highly associated with socio-economic status and deprivation, as are smoking in pregnancy, poor maternal health and births to women born outside the UK. Mothers from routine and manual occupational groups are also less likely to breastfeed than women from professional and managerial groups, which can result in poorer immunity and poorer digestive health for the baby.

In North Lincolnshire, an analysis of infant deaths registered between January 2003 and October 2014 suggests a strong association between infant deaths and deprivation, with rates almost twice as high in the most deprived 20% neighbourhoods compared with the least deprived 20%. However, even pooled over 11 years, the number of deaths is too small to enable any robust in depth analysis and the differences observed are not statistically significant.

**Figure 13: Infant mortality rates in North Lincolnshire by deprivation score of mothers' neighbourhood, 2003-2014**



Source: PCMD, North Lincolnshire Council



### Safe sleeping

The causes of sudden infant death syndrome, (SIDS), are not known. However there are some factors which are known to make SIDS more likely. This includes placing a baby on their front or on their side. More recent national evidence reviews suggest that there is a statistical relationship between co-sleeping and SIDS, although there is insufficient evidence to suggest that co-sleeping causes SIDS. This association is stronger when the parent, and/or partner smokes, is greater after recent alcohol or drug consumption by a parent or carer, and is higher amongst babies of premature birth or low birth weight.

In the 12 years between 2003-2014, there were fewer than 5 sudden infant deaths in North Lincolnshire associated with bedsharing and/or overlaying.

### Additional risk factors for stillbirth

In many cases of stillbirth, (in at least 30% of cases), the cause of the baby's death cannot be established. Nationally, it is estimated that less than 10% of stillbirths result from an abnormality present at birth. Other stillbirths are caused by problems with the mother's health, such as pre-eclampsia, as well as problems with the placenta (25%) (for example when it separates from the womb too early), cord problems, (10%) or an infection during pregnancy.

Other known risk factors for both stillbirth and infant mortality include:

- Foetal growth restriction (FGR)
- Obesity in pregnancy
- Maternal and infant nutrition
- Teen pregnancies
- Low or late take up of ante natal care
- Having diabetes, high blood pressure or a blood-clotting disorder
- Substance misuse, especially cocaine

**Foetal growth restriction (FGR)** is the biggest risk factor for stillbirth in the UK; the risk being greater when growth restriction is not detected ante-natally. A 2012 English study of stillbirths (CMACE, 2013), suggests that an important strategy in reducing stillbirths is improving antenatal screening and detection of growth restriction and subsequent management of pregnancy and delivery. Regional implementation of accredited foetal growth training and protocols has been shown to increase FGR detection, and could potentially reduce stillbirth rates. Nationally, it is estimated that up to three quarters of Trusts have already adopted this protocol, including Northern Lincolnshire and Goole Hospital Trust.

**Maternal obesity** Adult obesity rates are above the national average in North Lincolnshire and local data suggests rates amongst pregnant women are particularly high.

In 2014/15, 24% of pregnant women in North Lincolnshire were assessed as obese at first booking, (ie with a BMI of 30+), 3.2% as morbidly obese, (ie BMI of 40+) and 0.1% as super morbidly obese, (BMI of 50+). National NICE guidance suggests that women with a BMI of 30+ should be offered support and advice on weight management during pregnancy, whilst pregnant women with a BMI 35+ should be cared for by an obstetrician, with an individual assessment of local need undertaken by midwives.

According to local data, in 2014/15 the proportion of pregnant women booking in with a BMI of 35 or more in North Lincolnshire was 8.8%. This compares with 4.9%, nationally (based on CEMACH data for 2009).<sup>1</sup>

**Take up of antenatal care** in the first few weeks of pregnancy is relatively high in North Lincolnshire. Across North Lincolnshire as a whole, just under 9 out of 10 (88%) pregnant women are booked in with a midwife within 12 weeks of pregnancy (NHS, HSCIC, 2014). Of the remaining 12% who are booked in later than this, (a total of 230 women a year in North Lincolnshire), 66 (4% of all women booking in that year) do not see a midwife until at least their 20<sup>th</sup> week of pregnancy.

Whilst this is a significantly better result than that reported nationally or regionally, and represents an improvement on previous years, it is still slightly lower than in neighbouring North East Lincolnshire, a CCG which shares the same maternity care provider, where rates of early take up are 90% and above.

Local and national analyses of why women book in with midwifery later than the recommended 12 weeks or less suggest a range of reasons, including:

- Late acknowledgement or acceptance of pregnancy
- Population mobility – eg new arrivals to the area or transfers from other hospital trust
- Difficult social circumstances
- Under consultant already and not clear about booking in process
- Supply side factors such as difficulties in getting an appointment at a convenient time
- Delay as a result of going to GP first to confirm pregnancy

These issues suggest the need for a review of pathways into the service, as well as raised awareness amongst women and their families of the importance of taking up a midwifery appointment at the earliest opportunity.

### **Inequalities and stillbirths**

There is evidence nationally and internationally of variation in stillbirths by deprivation, with women being at higher risk in deprived areas. A national study based on 21,500 registered stillbirths that took place in England between 2000-2007 investigated this issue further. This study found that stillbirths relating to mechanical issues during labour were the only specific cause where there was no evidence of a deprivation gap. All other causes showed a significant deprivation gap in stillbirth rates, which varied from a 1.7 to 3.1 fold difference.

The widest deprivation gap was seen for deaths due to antepartum haemorrhage. Wide deprivation gaps were also seen for deaths due to congenital anomalies, and maternal disorders such as hypertension. The deprivation gap was also wider for stillbirths that were small for gestational age compared with those that were not small for gestational age. Data on risk factors and lifestyle behaviours were not available for this study, so a degree of confounding between deprivation linked risk factors and stillbirths is likely to have taken place. For example, smoking and obesity are both risk factors for stillbirth and are both strongly associated with deprivation.

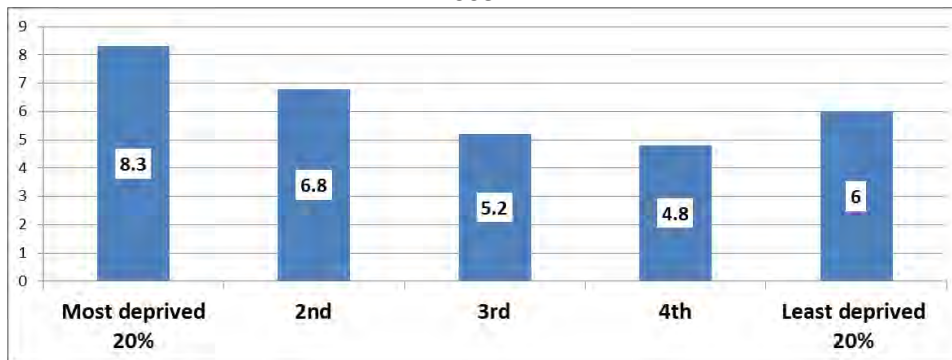
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<sup>1</sup> The Centre for Maternal and Child Health Enquiries (CMACE) formerly known as Confidential Enquiry in to Maternal and Child Health (CEMACH) conducted a national audit of obesity during pregnancy in 2009 of all pregnant women under 24 weeks gestation.

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The graph below is based on more than 120 stillbirths which were recorded in North Lincolnshire in the 11 years between 2003-2013. This suggests higher stillbirth rates amongst women living in the most deprived 20% neighbourhoods in North Lincolnshire, although with a narrower gap than that reported nationally. However, the number of local stillbirths each year is relatively small and even pooled over 11 years the number of cases is not large enough to enable robust statistical evidence of a differences in stillbirth rates by deprivation score of mother's neighbourhood.

**Figure 14: Still birth rates in North Lincolnshire by deprivation score of mother's neighbourhood, 2003-14**



Source: ADBE, 2003-2011

Table 3 illustrates the local inequality gap in risk factors locally, with almost a five fold difference in rates of smoking in pregnancy in North Lincolnshire, and a two-fold gap in younger age at delivery.

**Table 2: Inequalities in risk factors for stillbirths and infant mortality in North Lincolnshire, by least and most deprived 20% neighbourhoods, 2014**

	Maternal obesity (BMI 35+) 2014/15	Mum < 20 at birth 2014/15	Low birthweight (<2500g) at full term 2014/15	Women smoking in pregnancy (2014/15)	Late uptake of antenatal care (ie. 20+weeks) (2014/15)	B'feeding Initiation (2014/15)	Infant mortality rate pooled (2003-14)	Stillbirth rate pooled (2003-2014)
<b>Most deprived 20% N Lincs neighbourhoods</b>	11%	8%	2%	34%	5%	60%	8.7 per 1000	8.3
<b>Least deprived 20% N Lincs neighbourhoods</b>	7%	3%	0%	7%	5%	71%	4.8 per 1000	6.0
North Lincolnshire average	8%	6%	2%	19%	4%	67%	4.5 per 1000	6.4

Source: PCMD, ADBE, NLaG, North Lincolnshire Public Health Intelligence Team,

## User voice

### National Family and Friends Test (2014/15)

National surveys of users of maternity services confirm that outcomes are generally perceived by pregnant women in North Lincolnshire to be good, and that on the whole local women are satisfied with the care they receive. The new Family and Friends Test (FFT) is a single question national survey which asks patients whether they would recommend the NHS service they have received to friends and family who need similar treatment or care. As of October 2013, the survey was extended to include all women of any age who use NHS funded maternity services.

The latest data available for 2014/15 patients at Scunthorpe General, Northern Lincolnshire and Goole Hospital Trust, was based on just 72 responses, of which at least 96% said they would recommend the maternity unit to friends or family. This compares with 94% nationally.

The Government's aim is for a coherent framework of services for children and families, from pregnancy to age five which focus on promoting children's development and help with all aspects of family life. The aim is to offer choice for all families, whilst also providing more targeted support for those in greatest need.

### Local maternity research (2014)

Local research was undertaken jointly between North Lincolnshire CCG, Northern Lincolnshire and Goole Hospital Trust and North Lincolnshire Council Public Health, between February – July 2014, to explore issues relating to pregnant women's access to maternity services and the need and opportunity to tackle risk factors such as obesity and smoking in pregnancy. The research included a particular focus on women from disadvantaged areas and from BME (Black and Minority Ethnic) communities.

Summary messages from the final report include:

- Information to encourage women to contact midwifery services first is not entirely embedded across health services in North Lincolnshire. As a result women who seek confirmation via a GP appointment may experience a delay in receiving the information and advice provided over the telephone and at the first appointment.
- Women who smoke do not receive any information about smoking in pregnancy until their first appointment, as this is not included in the Pregnancy Pack. Neither does the Pregnancy Pack contain any contact details of local support services such as Start4Life, Health Trainers or stop smoking services – all extremely useful for women in the early stages and throughout pregnancy.
- Many women spoke about wishing to give up smoking without the added 'pressure' of attending services, as they saw it. Most of the women interviewed who smoked were still trying to adopt healthy lifestyles particularly in relation to what they ate. It cannot therefore, be assumed that they were indifferent to all health messages, rather they were being pragmatic in what they felt they could manage without inducing stress for themselves.
- There are a number of professional agencies in North Lincolnshire, provided by both the public and third sectors, which offer advice and practical support to develop and maintain a healthy lifestyle. Whilst Start4Life was mentioned by many women as a topic that had been discussed at their first appointment, none mentioned Health Trainers, ante natal classes or other services.

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- There are a number of organisations providing social welfare support in disadvantaged neighbourhoods in North Lincolnshire, with a proven track record of effective engagement with ‘hard to reach’ communities. There may be scope to develop the links with these community assets to overcome barriers to access for disadvantaged women in the early stages of pregnancy and beyond.

This report is published in full, with a number of recommendations on the Health and Wellbeing pages of the Council website at [http://nldo.northlincs.gov.uk/IAS Live/sa/jsna/surveys](http://nldo.northlincs.gov.uk/IAS_Live/sa/jsna/surveys)

### What works to reduce infant deaths/stillbirths

There are a range of factors associated with an increased risk of stillbirths and neonatal mortality, which are potentially modifiable.

- **The health of the mother**, and in particular whether they smoke or are obese, is an important risk factor for stillbirth and infant mortality. In addition to supporting women to stop smoking and to lose weight once they are pregnant, there also needs to be a focus on supporting women of child bearing age to stop smoking and to attain a healthy weight prior to conceiving and coming into contact with maternity services.
- **Accessible, high quality and safe maternity services** are critical to reducing stillbirths and neonatal deaths. It is important that:
  - Women access antenatal services early in their pregnancy and continue to attend appointments regularly.
  - Maternity services identify and respond appropriately to risk factors including smoking, obesity and foetal growth restriction.
  - Maternity services are safe and high quality throughout the antenatal, labour, postnatal and where necessary neonatal stages of care
- It is also important that there is **appropriate review and audit** undertaken of cases of stillbirth and neonatal mortality to identify lessons that can be learnt.
- **Inequalities in maternal and infant health** - The report of the Department of Health’s National Infant Mortality Support Team, ‘Tackling health inequalities in infant and maternal health outcomes’ (2010) summarised the potential impact of improvements in the wider social determinants of health on the gap in infant mortality rates between the routine and manual (R&M) groups and the population as a whole. The following calculations are based on modelling of 1999-2002 data undertaken on behalf of the National Support Team.
  - **Raising breastfeeding initiation rates in the R&M group to those of the non-R&M group** would contribute **4 percentage points**.
  - **reducing child poverty** – (ie halving the number of children in relatively low-income households between 1998-99 and 2010-11, would contribute **3 percentage points**;
  - **reducing the prevalence of obesity in the R&M group** by 23% to the current levels in the population as a whole – **2.8 percentage points**;
  - **reducing smoking in pregnancy in the R&M group** from 23% to 15% - **2 percentage points**;
  - **improving housing and reducing overcrowding** – **1.4 percentage points**,
  - **reducing sudden unexpected deaths in infancy (SUDI) by persuading one in 10 women in the R&M group to avoid sharing a bed with their baby** or putting their baby to sleep prone (on its front) – **1.4 percentage points**;

- **halving the under 18 conception rate - one percentage point.**

This Review undertaken on behalf of the National Support Team concluded that the combined and full effect of these actions would narrow the infant mortality gap between manual R&M groups and the rest of the population by 15.6%

- The Review also identified other potentially effective interventions, including
  - **ensuring early access to antenatal care** (early booking),
  - **effective use of high quality healthcare** and
  - **improving maternal educational attainment**

## Key local strengths/assets (what we are doing)

There is a wide range of work occurring across North Lincolnshire, either directly or indirectly, to reduce the rates of stillbirths and infant mortality. Some examples include:

- **The Maternity Partnership Group** - is a multi agency group with representation from a range of local statutory agencies, with a focus on improving the quality and safety of maternity services and reducing stillbirths and neonatal mortality in the local population
- **Local Safeguarding Children Board (LSCB)** and related subgroups including the Child Death Overview Panel (CDOP) monitor potentially avoidable child deaths and disseminate key messages of local reviews and lessons learned where appropriate
- **Local smoking cessation services** work in partnership with maternity services to reduce smoking in pregnancy, including the use of carbon monoxide monitoring and a dedicated stop smoking advisor for pregnant women
- **Pilot stop smoking support service for young people** in operation in 7 secondary schools
- **Maternal weight** included as a key priority in the new adult weight management service
- **Safe sleeping guidance** has been developed and adopted across North Lincolnshire
- **Comprehensive sexual health services** and targeted work in schools and other settings to reduce teen conceptions and promote better sexual health
- Introduction of customised growth charts within maternity service including staff training
- **Multi-disciplinary review** of all stillbirths and dissemination of learning
- Review of maternity services and ongoing work to increase the quality and safety of the service
- **New RCOG guidelines implemented** regarding monitoring small for gestational age babies, and pilots trialled e.g. screening with Doppler scans for high risk pregnancies
- Measures being taken to increase the uptake of post mortems
- A workstream to improve the bereavement support for families that have had a stillbirth
- **Expansion of the Family Nurse Partnership** in North Lincolnshire, ( a structured nurse-led programme for first time young parents, (under 20 years of age), who are not in education, employment or training which provides support from pregnancy through to birth and the child's early years). This programme offers more concentrated antenatal and postnatal support and advice than universal services, and positively impacts on the health of parents and children.

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- **Breastfeeding Peer Support Service** which has been successful in raising initiation rates over the last 4 years
- **Achievement of Stage 2 Unicef Baby Friendly** Initiative and commitment to work to Stage 3.
- North Lincolnshire CCG in partnership with North East Lincolnshire and Lincolnshire CCGs will be an early implementer of the national NHS Diabetes Prevention programme in 2016, which should enable early diagnosis and prevention of diabetes amongst adults including child bearing age women, contributing to improved outcomes.

## Key issues for the future

- Changing demographic profile, and increasing diversity of population of women of childbearing age
- Rising levels of obesity in the population of women of childbearing age
- Increasing risk of type 2 diabetes in the childbearing age population
- Higher than average rates of smoking amongst teenage girls in North Lincolnshire, which although falling, have not declined as fast they have for boys. 15% 15 year old girls in North Lincolnshire reported being regular smokers in the 2013 adolescent lifestyle survey, compared with 8% nationally.
- Reconfiguration of specialist services, between Public Health England, NHS England, NHS North Lincolnshire CCG, and local authority Public Health.
- Maintaining priority focus on maternal and infant health in the Joint Health and Wellbeing Strategy
- Raising awareness of the risks of smoking and excess weight to young women prior to conception
- National review of maternity services as outlined in the NHS Five Year Forward View – which is planned to conclude by end of 2015.
- Implementation of the recommendations of the national confidential enquiry into maternal deaths and morbidity, 2011-13, 'Saving Lives, Improving Mothers Care' and of the National Diabetes in Pregnancy Audit, 2014
- Healthy Lives Healthy Futures review of acute provision in Northern Lincolnshire and Goole.

## Recommendations

- Develop a strategic focus on improving preparation for pregnancy for women with key risk factors, including women of child bearing age with, or who are at risk of developing diabetes, women who smoke, women with significant mental health problems.
- Raise awareness amongst staff and the public about the importance of healthy weight and diabetes management prior to conception, and the need to seek specialist medical advice at the earliest opportunity in pregnancy
- Incorporate this into patient education for women with Type 2 diabetes
- Focus on improving blood sugar control for women with diabetes during pregnancy
- Routine data monitoring of the number of women of child bearing age with Type 1 and Type 2 diabetes by GP practice in order to target women appropriately for pre conception information.

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- Review pathways into maternity services to ensure that women, especially those at high risk are accessing antenatal care early in pregnancy.
- There are a number of organisations providing social welfare support in disadvantaged neighbourhoods in North Lincolnshire, with a proven track record of effective engagement with 'hard to reach' communities. There may be scope to develop the links with these community assets to overcome barriers to access for disadvantaged women in the early stages of pregnancy and beyond.

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